REMARKS

Applicant thanks the Examiner for his continued attention to the application. The Examiner's response to the arguments previously submitted rely on the fact that the amended claims related to a roller rather than a roller assembly, as initially claimed, and therefore, that the distinctions made by Applicant in the response were inconsistent with the scope of the claims. Applicant notes that the change of claim scope from roller assembly to roller was made in response to the rejection set forth in the February 16, 2004 Office Action, but was apparently improvident. Applicant has now restored the original scope of the claims so that they clearly relate to a roller assembly as used in transporting a sheet material through a nip formed between a roller and an opposed surface in which the construction of the roller is set forth in detail.

The claims, however include not only the roller but the opposed surface with which the roller forms a nip.

Claims 6, 8 through 11 and 27 are rejected under 35 USC 103 as unpatentable over Gehrer in view of Snelling. The examiner's characterization of Gehrer and Snelling is accepted for purposes of this response. Applicant respectfully submits however that it would not be obvious to one in ordinary skill in the art to combine the two references.

The invention relates to a roller assembly for use in transporting a sheet material through a nip formed between a roller and an opposed surface. Neither of the references relate to a roller for such an assembly. Gehrer relates to a roller for use in a conveyer or feed roller for conveying work pieces of different

sizes along the work path from a supply point, past work zones in which the work pieces are treated, and to a delivery point. Gehrer provides a roller that is used in combination with a multiplicity of other rollers for conveying work pieces by permitting them to roll along the tops of the rollers. This is described in column 2, line 36 *et seq* where Gehrer says:

> "Referring now to the drawing and to figures 1 and 2, in particular there is illustrated a preferred embodiment of the present invention which comprises a cylindrical shaft member on which a plurality of substantially identical or equally shaped angular roller elements are mounted adjacent to each other."

The aim, as set forth in column 3, line 14 et *seq* is so that the conveyor roller is capable of readily engaging work pieces of widely varying size without there being any danger of damage either to the work piece, the roller or the mounting. Nowhere in Gehrer is there any suggestion that such a roller would be useful in a roller assembly used in transporting the sheet material through a nip. The difference is more than semantic. In applicant's invention, as clearly set forth in the written description thereof, it is a principle aim of the invention to reduce skew as sheet materials such as paper in printers, copiers or the like as is transported through a nip. In order to reduce skew, it is important that the portions of the rollers that contact the paper move at the same speed across the width of the paper or skew will be introduced. One way to do this is to provide shafts that are sufficiently rigid that they do not bend to any perceptible degree. This isn't practical in many applications. The present invention that uses rollers

having a non-compliant outer layer fixed to a compliant core comprised of an open cell foam solves these problems.

The speed at which the rollers move is of no significance in Gehrer. The non-compliant outer layer assures that the linear speed of the roller at the nip remains constant and the compliant core made from open cell foam has low thermal hysteresis and therefore generates relatively little heat when it is repeatedly compressed. Open cell foam dissipates heat more easily than closed cell material or any of the materials described in Gehrer. Gehrer uses rubber, a material clearly not selected for its low thermal hysteresis.

Snelling, like Gehrer, relates to a roller used for a purpose unlike applicant's roller. It is essential in Snelling that the outer layer 14 be resilient and a piezoelectric polymer film is preferred (column 4, lines 50 – 54). Snelling's roller wouldn't work with a non-compliant outer layer as claimed by applicant. Snelling's layer relies on deformation to create a charge for transferring toner from a charge roller to a sheet of paper. Clearly there is nothing in Snelling that would suggest using a non-compliant outer layer because doing so would destroy the efficacy of Snelling. Since there is nothing in Gehrer that would suggest using an open cell foam, and such a foam would provide no advantage to Gehrer, the suggestion to combine these two references must come from applicant's invention and this isn't permitted.

Applicant has added a new Claim 28 directed to a roller *per se*. Applicant submits that this claim, which corresponds substantially to previously presented Claim 27 with a further limitation as to the material from which the compliant core

is made. More specifically, in new Claim 28, the compliant core is specifically described as a compressible open cell foam. This material provides significant advantages over the rubber of Gehrer. Specifically, rubber is not compressible. It is, as noted by Gehrer, resilient but there is a difference. Rubber and other non-compressible resilient materials, if used in Applicant's invention, could displace in response to variations in the width of the nip but would not compress. If a material is resilient but not compressible, substantially more work is required to displace it and substantial heat is generated. In addition, a compressible material which could be compressed without substantial displacement generates substantially less heat and requires less work to compress.

Poisson's ratio provides a convenient measure of the suitability of a material for use in a roller assembly in accordance with this invention. In compressible materials like rubber may have a Poisson's ratio of approximately 1/2. Compressible foam materials, as claimed, typically have a Poisson's ratio of approximately .2. The higher Poisson's ratio of rubbery materials make them unsuitable for use in the rollers of this invention. Applicant encloses a copy of an article which while demonstrating the unsuitability of rubber as an impact reducing material in shoes, applies to this application as well. The significant difference between rubbery materials as described by Gehrer and compressible foam materials as claimed by Applicant and described by Snelling make the substitution suggested by the Examiner far from obvious. The materials act completely differently and there is nothing in either of the references that would suggest that a foam material would provide any advantage in Gehrer. The

suggestion to make the substitution comes only from Applicant's invention. The application of hindsight to the references based on the Applicant's invention is, no doubt, seductive but improper and Applicant respectfully submits that the rejection should be reconsidered and withdrawn.

February 18, 2005

Respectfully submitted,

Brian B. Shaw, Registration No. 33,782
HARTER, SECREST & EMERY LLP
1600 Bausch & Lomb Place
Rochester, New York 14604
Telephone: 585-232-6500
Fax: 585-232-2152